

Application Serial No.: 10/621,478  
Applicants: James Gary Pruett, et al.  
Response to Office Action Dated: September 12, 2007  
Response Filed: December 17, 2007

Docket No.: HTI.P.8213

### **III. REMARKS**

United States Serial No. 10/621,478 was filed on July 17, 2003.

Claims 1-41 have been canceled by the present submission to place the application in better condition for allowance.

Claim 42 has been amended by the present submission.

New claims 53-56 have been added by the present submission. Because Applicants have previously paid for a total of 52 claims, and claims 1-41 have been cancelled, Applicants submit that no further fees are due.

In view of the amendments and remarks set forth herein, Applicants respectfully request reconsideration and allowance of claims 42-56.

#### **35 U.S.C. §102/103 Rejections**

Claims 42-44, 46-49 and 51 have been rejected under 35 U.S.C. §102(b) or in the alternative under 35 U.S.C. §103(a) in view of U.S. Patent No. 5,547,512 (hereinafter "Gabor"). The Office Action expressly concedes that Gabor does not disclose the claimed variation in the mass of the pyrolytic coating deposited on the fibrous substrate. Nevertheless, it is alleged that it is reasonable to presume that the material of Gabor would necessarily possess the claimed uniformity of coating or it would have been obvious to control the processing parameters of Gabor to arrive at the desired coating uniformity. Applicants respectfully traverse this rejection.

The presently claimed continuous roll composite material comprises a fibrous substrate having a high surface area with a pyrolytic carbon addition uniformly deposited thereon. The pyrolytic carbon is deposited on the fibrous substrate within a furnace wherein the walls of the furnace are spaced apart from the surface of the substrate by a distance that is

small enough to allow convective and diffusive transport of the process gas to the substrate to permit substantially uniform deposition of pyrocarbon into pores of the substrate and/or onto the surface of the substrate at the carbon decomposition temperature in preference to the decomposition of the process gas to produce soot and tar on the inner walls of the furnace. The combination of a high surface area starting fibrous substrate and optimized fibrous substrate surface area to furnace inner wall surface area ratio results in efficient and uniform deposition of pyrolytic carbon in and on the fibrous substrate. This substantially eliminates the formation of soots and tars on the inner walls of the furnace caused by gaseous side reactions.

Gabor does not teach or suggest to use a high surface area starting fabric or to optimize the ratio of substrate surface area to furnace wall surface area to control the deposition. In fact, the practice of Gabor results in the formation of soots on the inner walls of the furnace, which must be "cleaned" with a tool. Gabor expressly teaches:

Deposition takes place not only on the tow 20 but also on the walls of the furnace tube 12. See Column 5 at Lines 51-52.

Also accumulating in the furnace tube are soot particles that form by homogeneous nucleation and growth. Many of these soot particles are carried out by the flux, but others deposit on the wall of the furnace tube and on the fuzzball, densifying the latter. If left in the furnace tube, the fuzzball and soot deplete the gaseous reactants, become cemented together by CVD, and increasingly rub against the fibrous material. This causes breakage of additional filaments and eventually of the whole fibrous material. The elongated tools of FIGS. 2 and 3 are effective for removal of the fuzzballs and soot. See Column 6 at Lines 1-11.

A relatively short furnace tube with an unrestricted outlet is used. . . . This allows the periodic removal of fuzz and soot without the interruption of the coating process. See Abstract at Lines 2-7.

The furnace tube of the coating apparatus is provided with a uniform inside diameter of sufficiently large size to receive a tool for periodic cleaning while the apparatus is in use. See Column 3 at Lines 20-24.

Gabor also teaches the use of a liner which can be removed upon the accumulation of a certain amount of soot. Gabor specifically discloses:

The furnace tube can be fitted with liner that is easily replaced simply by pulling it through the outlet. This allows deposits to be eliminated without disturbing either the inlet for the fibrous material or the intake means. See Column 3 at Lines 36-40.

Gabor does disclose “enhancing” the uniformity of the coating thickness on the fibrous material by operating at low temperatures and low partial pressures. Importantly, however, Gabor does not teach or suggest a high surface area fibrous substrate, or to optimize the ratio of the fibrous substrate surface area to furnace volume so as to maximize the uniformity of the deposited coating on the substrate and to limit competitive gas side reactions that result in deposition of soot and tars on the inner walls of the furnace and inconsistent substrate coating. In the absence of positive teachings or suggestions in Gabor regarding to utilize high surface area starting fabrics or to optimize the substrate to furnace wall surface areas ratio, it cannot be assumed that the material of Gabor inherently possesses the presently claimed deposition uniformity. Applicants, therefore, respectfully request that this rejection be withdrawn.

Claims 45, 50 and 52 have been rejected under 35 U.S.C. §103(a) over Gabor in view of Wilson for the reasons set forth in Paragraph 5 of the Office Action. Applicants respectfully traverse.

The Office Action expressly concedes that Gabor does not disclose the claimed variation in the mass of the pyrolytic coating deposited on the fibrous substrate. The Office Action also concedes that Gabor does not teach that the fabric may contain inorganic whiskers. For the reasons set forth hereinabove, Applicants submit that it cannot be assumed that the material of Gabor possesses the same deposition uniformity. Those remarks are incorporated into the 103(a) rejection over Gabor in view of Wilson. While Wilson discloses the use of inorganic fibers and whiskers, the combination of Gabor and Wilson does not teach a high surface area substrate with the claimed uniform pyrolytic deposition. Applicants, therefore, respectfully request that this rejection be withdrawn.

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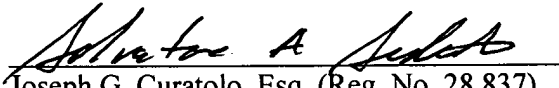
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In view of the above remarks, Applicants respectfully request that the rejection of independent claim 42 be withdrawn. Claims 43-56 ultimately depend from independent claim 42 and merely serve to further limit claim 42. Applicants therefore respectfully request the issuance of a formal notice of allowance directed to claims 42-56.

Should the Examiner have any questions, Applicants' undersigned attorney would welcome a telephone call.

Respectfully submitted,

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